

AMENDMENT UNDER 37 C.F.R. § 1.111
Application Serial No. 10/020,130
Attorney Docket No. Q67762

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Claim 1 (currently amended): A transmission power control method for controlling transmission power of downlink signals from base stations to a mobile terminal in a mobile communications system, comprising the steps of:

selecting, at the mobile terminal, a first base station, said first base station transmitting user data in a downlink signal with a preferred reception quality;

transmitting, from the mobile terminal, identification of the selected first base station to the first base station and other base stations not selected by said mobile terminal;

determining, at the mobile terminal, transmission power of downlink signals from the selected first base station and the other base stations not selected by said mobile terminal, said other base stations transmitting user data in said downlink signals to the mobile terminal after the identification of the selected first base station is transmitted; and

sending information, from the mobile terminal to the selected first base station and the other base stations, to modify the transmission power of the downlink signals of the selected first base station and the other base stations based on the determined transmission power of the downlink signals from said selected first base station and said other base stations not selected by said mobile terminal,

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wherein said other base stations terminate transmission of user data to said mobile terminal if said identification, which is transmitted by said mobile terminal, is properly received at the other base stations, and said other base stations continue to transmit user data after said selecting of the first base station if said identification of the selected first base station transmitted by said mobile terminal is not properly received at the other base stations,

wherein said other base stations transmit user data to said mobile terminal prior to the selecting of said first base station, and said other base stations do not properly receive said identification of the selected first base station and continue to transmit without terminating transmission of user data,

wherein the information sent from the mobile terminal to the selected first base station and the other base stations to modify the transmission power of the downlink signals of the selected first base station and the other base stations is transmitted while the first base station is selected as transmitting user data with the preferred reception quality.

Claim 2 (previously presented): A transmission power control method according to claim 1, wherein the step of determining comprises estimating uplink reception quality of said other base stations.

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Claim 3 (previously presented): A transmission power control method according to claim 2, wherein signal weights are determined for the downlink signals from said other base stations based on the uplink reception quality.

Claim 4 (previously presented): A transmission power control method according to claim 2, wherein said estimating comprises calculating a correlation between an increase or decrease in transmission power instructed by a transmission power control, and an increase or decrease in transmission power of a downlink signal received from a base station that is transmitting user data to the mobile terminal after the first base station is selected, wherein said correlation is calculated based on a difference of the increase or decrease of the transmission power instructed and the increase or decrease in the transmission power of the downlink signal received.

Claim 5 (previously presented): A transmission power control method according to claim 1, wherein a signal obtained by combining weighted downlink signals from said other base stations is used to determine whether the transmission power of the other base stations is excessive or insufficient.

Claim 6 (currently amended): A receiving method for demodulating user data in a downlink signal from base stations to a mobile terminal in a mobile communications system, comprising the steps of:

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selecting, at the mobile terminal, a first base station, said first base station transmitting user data in a downlink signal having a preferred reception quality;

transmitting, from the mobile terminal, identification of the selected first base station to the first base station and other base stations not selected by said mobile terminal; and

using downlink signals from said other base stations not selected by said mobile terminal, said other base stations transmitting user data after the identification of the selected first base station is transmitted, to demodulate, at the mobile terminal, user data from said selected first base station by combining the downlink signal of the selected first base station and the downlink signals from said other base stations not selected by said mobile terminal,

wherein said other base stations terminate transmission of user data to said mobile terminal if said identification, which is transmitted by said mobile terminal, is properly received at the other base stations, and said other base stations continue to transmit user data after said selecting of the first base station if said identification of the selected first base station transmitted by said mobile terminal is not properly received at the other base stations,

wherein said other base stations transmit user data to said mobile terminal prior to the selecting of said first base station, and said other base stations do not properly receive said identification of the selected first base station and continue to transmit without terminating transmission of user data,

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wherein said step of using comprises determining an estimated uplink reception quality of said other base stations based on measuring, at the mobile terminal, transmission powers of each of the downlink signals from the other base stations,

wherein the user data from the selected first base station is demodulated by combining the downlink signal of the selected first base station and the downlink signals from said other base stations not selected by said mobile terminal such that the downlink signals from the other base stations are individually weighted based on the estimated uplink reception quality and combined with the downlink signal of the selected first base station while the first base station is selected as transmitting user data having the preferred reception quality.

Claim 7 (canceled).

Claim 8 (currently amended): A receiving method according to ~~claim 7~~claim 6, wherein signal weights are determined for the downlink signals from said other base stations based on the uplink reception quality.

Claim 9 (currently amended): A receiving method according to ~~claim 7~~claim 6, wherein said estimating comprises calculating a correlation between an increase or decrease in transmission power instructed by a transmission power control, and an increase or decrease in

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transmission power of a downlink signal received from a base station that is transmitting user data to the mobile terminal after the first base station is selected, wherein said correlation is calculated based on a difference of the increase or decrease of the transmission power instructed and the increase or decrease in the transmission power of the downlink signal received.

Claim 10 (previously presented): A receiving method according to claim 6, wherein a signal obtained by combining weighted downlink signals from the other base stations is used for demodulating the user data from said first base station.

Claims 11-17 (canceled).

Claim 18 (currently amended): A mobile terminal that controls transmission power of downlink signals from base stations in a mobile communications system, comprising:
base station selecting means for selecting a first base station that is transmitting user data in a downlink signal with a preferred reception quality;
transmission means for transmitting, from the mobile terminal, identification of the selected first base station to the first base station and other base stations not selected by said mobile terminal;

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downlink signal weight decision means for determining transmission power of downlink signals from the selected first base station and the other base stations not selected by said mobile terminal, said other base stations transmitting user data in said downlink signals to the mobile terminal after the identification of the selected first base station is transmitted; and

downlink TPC command decision means for using the downlink signals from said other base stations, to decide whether transmission power of selected first base station and said other base stations is excessive or insufficient, and to instruct an increase or decrease of said transmission power based on the determined transmission power of the downlink signals from said selected first base station and said other base stations not selected by said mobile terminal by transmitting information from the mobile terminal,

wherein said other base stations terminate transmission of user data to said mobile terminal if said identification, which is transmitted by said mobile terminal, is properly received at the other base stations, and said other base stations continue to transmit user data after said selecting of the first base station if said identification of the selected first base station transmitted by said mobile terminal is not properly received at the other base stations,

wherein said other base stations transmit user data to said mobile terminal prior to the selecting of said first base station, and said other base stations do not properly receive said identification of the selected first base station and continue to transmit without terminating transmission of user data,

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wherein the information sent from the mobile terminal to the selected first base station and the other base stations to modify the transmission power of the downlink signals of the selected first base station and the other bases stations is transmitted while the first base station is selected as transmitting user data with the preferred reception quality.

Claim 19 (currently amended): A mobile terminal for receiving user data in the downlink signal from base stations in a mobile communications system, comprising:

base station selecting means for selecting a first base station that is transmitting user data in a downlink signal with a preferred downlink reception quality;

transmission means for transmitting, from the mobile terminal, identification of the selected first base station to the first base station and other base stations not selected by said mobile terminal;

downlink signal weight decision means for determining transmission power of downlink signals from said other base stations not selected by said mobile terminal, said other base stations transmitting user data in said downlink signals to the mobile terminal after the identification of the selected first base station is transmitted; and

data demodulating means for using downlink signals from said other base stations, to demodulate user data from said first base station by combining the downlink signal of the selected first base station and the downlink signals from said other base stations not selected by said mobile terminal,

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wherein said other base stations terminate transmission of user data to said mobile terminal if said identification, which is transmitted by said mobile terminal, is properly received at the other base stations, and said other base stations continue to transmit user data after said selecting of the first base station if said identification of the selected first base station transmitted by said mobile terminal is not properly received at the other base stations,

wherein said other base stations transmit user data to said mobile terminal prior to the selecting of said first base station, and said other base stations do not properly receive said identification of the selected first base station and continue to transmit without terminating transmission of user data,

wherein said data demodulation means determines an estimated uplink reception quality of said other base stations based on measuring, at the mobile terminal, transmission powers of each of the downlink signals from the other base stations,

wherein the user data from the selected first base station is demodulated by combining the downlink signal of the selected first base station and the downlink signals from said other base stations not selected by said mobile terminal such that the downlink signals from the other base stations are individually weighted based on the estimated uplink reception quality and combined with the downlink signal of the selected first base station while the first base station is selected as transmitting user data having the preferred reception quality.

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Claim 20 (currently amended): A mobile terminal according to claim 18 or ~~claim 19~~, wherein said downlink signal weight decision means estimates uplink reception quality of said other base stations.

Claim 21 (previously presented): A mobile terminal according to claim 20, wherein signal weights are determined for the downlink signals from said other base stations based on the uplink reception quality.

Claim 22 (previously presented): A mobile terminal according to claim 20, wherein the downlink signal weight decision means calculates an estimated uplink reception quality from a correlation between an increase or decrease in transmission power instructed by a transmission power control, and an increase or decrease in power of a downlink signal received from a base station that is transmitting user data to the mobile terminal after the first base station is selected, wherein said correlation is calculated based on a difference of the increase or decrease of the transmission power instructed and the increase or decrease in the transmission power of the downlink signal received.

Claim 23 (previously presented): A mobile terminal according to claim 18, wherein the downlink TPC command decision means uses a signal obtained by combining weighted

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downlink signals from said other base stations to decide whether transmission power of the other base stations is excessive or insufficient.

Claim 24 (previously presented): A mobile terminal according to claim 19, wherein said data demodulating means uses a signal obtained by combining weighted downlink signals from said other base stations to demodulate the user data.

Claim 25 (previously presented): A transmission power control method according to claim 1, wherein said other base stations not selected by the mobile terminal, which do not properly receive said identification of the selected first base station and continue to transmit without terminating transmission of user data, transmit user data to the mobile terminal in a downlink dedicated physical channel and transmit pilot data in a downlink dedicated control channel after the identification of the selected first base station is transmitted.

Claim 26 (previously presented): A receiving method according to claim 6, wherein said other base stations not selected by the mobile terminal, which do not properly receive said identification of the selected first base station and continue to transmit without terminating transmission of user data, transmit user data to the mobile terminal in a downlink dedicated physical channel and transmit pilot data in a downlink dedicated control channel after the identification of the selected first base station is transmitted.

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Claim 27 (previously presented): A mobile terminal according to claim 18, wherein said other base stations not selected by the mobile terminal, which do not properly receive said identification of the selected first base station and continue to transmit without terminating transmission of user data, transmit user data to the mobile terminal in a downlink dedicated physical channel and transmit pilot data in a downlink dedicated control channel after the identification of the selected first base station is transmitted.

Claim 28 (previously presented): A mobile terminal according to claim 19, wherein said other base stations not selected by the mobile terminal, which do not properly receive said identification of the selected first base station and continue to transmit without terminating transmission of user data, transmit user data to the mobile terminal in a downlink dedicated physical channel and transmit pilot data in a downlink dedicated control channel after the identification of the selected first base station is transmitted.

Claim 29 (new): A transmission power control method according to claim 1, wherein the information sent from the mobile terminal to the selected first base station and the other base stations is a transmission power control signal that is determined based on measuring transmission powers of downlink signals from the selected first base station and the other base stations together while the first base station is selected,

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wherein each of the selected first base station and the other base stations adjust respective transmission powers in response to receiving the transmission power control signal.

Claim 30 (new): A mobile terminal according to claim 18, wherein the information sent from the mobile terminal to the selected first base station and the other base stations is a transmission power control signal that is determined based on measuring transmission powers of downlink signals from the selected first base station and the other base stations together while the first base station is selected,

wherein each of the selected first base station and the other base stations adjust respective transmission powers in response to receiving the transmission power control signal.

Claim 31 (new): A mobile terminal according to claim 19, wherein signal weights are determined for the downlink signals from said other base stations based on the uplink reception quality.

Claim 32 (new): A mobile terminal according to claim 19, wherein the downlink signal weight decision means calculates an estimated uplink reception quality from a correlation between an increase or decrease in transmission power instructed by a transmission power

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control, and an increase or decrease in power of a downlink signal received from a base station

that is transmitting user data to the mobile terminal after the first base station is selected,

wherein said correlation is calculated based on a difference of the increase or decrease of
the transmission power instructed and the increase or decrease in the transmission power of the
downlink signal received.